

**Notice of Allowability**

Application No.

09/802,476

Examiner

Bharat N Barot

Applicant(s)

MADRUGA ET AL.

Art Unit

2155

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment and affidavit filed on 11/03/2004.
2. ☒ The allowed claim(s) is/are 1-12.
3. ☒ The drawings filed on 09 March 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date Attached.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

*Bharat Barot*  
**BHARAT BAROT**  
**PRIMARY EXAMINER**

(571)272-3979

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Robert F. Kramer (Reg. No. 51,242) on February 04, 2005.

3. The application has been amended as follows:

Claims 1-4, 6, 9-10, and 12 have been amended.

1. (Amended) A method of multicast communication within ~~an ad hoc broadcast~~ a wireless network, comprising:

defining a shared multicast mesh of routers for each multicast group wherein multiple paths are established between any two routers; and

forwarding packets from a source connected within the shared multicast mesh of the multicast group along ~~the~~ a reverse shortest path to ~~the~~ a receiver;

wherein the reverse shortest path is a shortest path from the receiver to the source.

2. (Amended) A method as recited in claim 1, wherein said routers are configured to accept unique packets being received from any neighboring router within the shared multicast mesh.

3. (Amended) A method as recited in claim 1, wherein said routers maintain the ~~mapping of~~ reverse shortest path mapping to the receivers.

4. (Amended) A method as recited in claim 3, wherein routers maintain the reverse shortest path mapping by sending out a heartbeat message to successors when packets arrive through ~~members~~ paths other than their respective reverse shortest path from traffic sources, wherein the heartbeat message as received by the successor triggers a push join operation to force the successor and all routers in the paths to the traffic sources to join the shared multicast mesh.

5. (Original) A method as recited in claim 3, wherein routing is established between routers such that network flooding with data or control packets to establish a routing structure is not required.

6. (Amended) A method as recited in claim 1, wherein routers for sender-only hosts ~~may~~ join the multicast mesh in simplex mode.

7. (Original) A method as recited in claim 1, wherein routers share group membership reports with neighbors and track relationships between neighbors and groups.

8. (Original) A method as recited in claim 7, wherein multicast addresses are mapped to one or more cores as part of a group membership report.

9. (Amended) A method as recited in claim 1, wherein routers are configured to allow the definition of multiple cores for a group within the shared multicast mesh.

10. (Amended) A method of allowing a host to join a multicast mesh for multicast communication within ~~an ad hoc broadcast~~ a wireless network, comprising:

determining ~~the~~ an address of a first multicast group to which said host desires to join;

interacting with a first designated router, by said host, requesting that it gain membership in said first multicast group;

announcing membership in the first multicast group if the first designated router joining has multiple neighboring routers which are duplex members of the first multicast group; and

sending a join request for membership in the first multicast group to neighboring routers if one or fewer of the neighboring routers are duplex members of the first multicast group.

11. (Original) A method as recited in claim 10, wherein the routers are configured to generate an acknowledgement to the join request, such that non-core routers can acknowledge group membership.

12. (Amended) A method of maintaining shortest path routes within a group's mesh populated with routers, comprising:

caching packet identifiers of forwarded packets in a cache;

forwarding a multicast packet from a neighboring router if the packet identifier is not contained within the cache; and

transmitting heartbeat messages whenever traffic arrives through a path from ~~the~~ a source that is not ~~the~~ a reverse shortest path, wherein the heartbeat message is configured to trigger a push join to correct routing;

wherein the reverse shortest path is a shortest path from the receiver to the source.

**ADDITIONAL REFERENCES**

4. The examiner as of general interest cites the following references.
- a. McCanne et al, U.S. Patent No. 6,850,987.
  - b. Mannepalli et al, U.S. Patent No. 6,842,425.
  - c. Borella et al, U.S. Patent No. 6,816,912.
  - d. Kondylis et al, U.S. Patent No. 6,721,290.
  - e. Orton et al, U.S. Patent No. 6,678,735.
  - f. Lamberg et al, U.S. Patent No. 6,408,000.

**CONTENT INFORMATION**


5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bharat Barot whose telephone number is (571) 272-3979. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alam, Hosain, can be reached at (571) 272-3978.

Any inquiry of general nature or relating to the status of this application should be directed to the group receptionist whose telephone number is (703) 305-3900.

Patent Examiner Bharat Barot  
Art Unit 2155

February 04, 2005

  
BHARAT BAROT  
PRIMARY EXAMINER